



Faculty of Biological Science and Technology
Zoology and Botanical Department
Practical Histology

Nervous Tissue

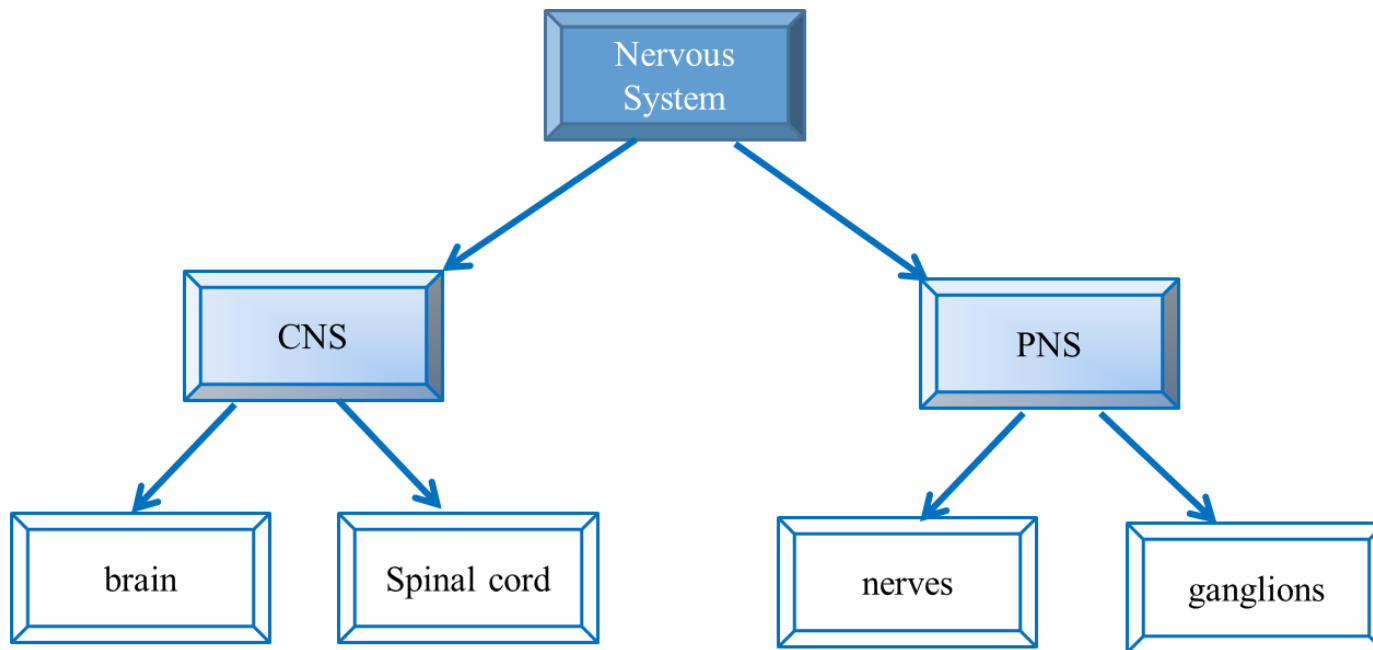
Part 3-Peripheral Nervous System

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Nervous system

- ▶ Nervous system is divided in two components:
 - ▶ Central nervous system (CNS), which includes brain and spinal cord
 - ▶ Peripheral nervous system (PNS), which includes nerves, ganglion and nerve endings



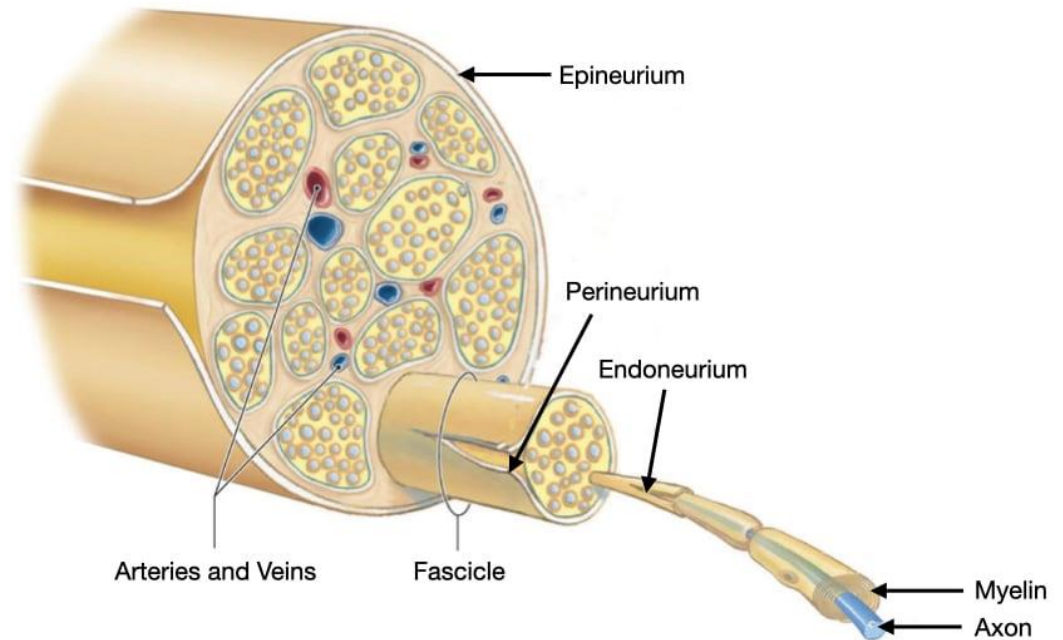


Nerves

- ▶ Nerves are composed of nerve fibers (axons) wrapped by Schwann cells (with or without myelin sheath) and connective tissue layers

General nerve organization

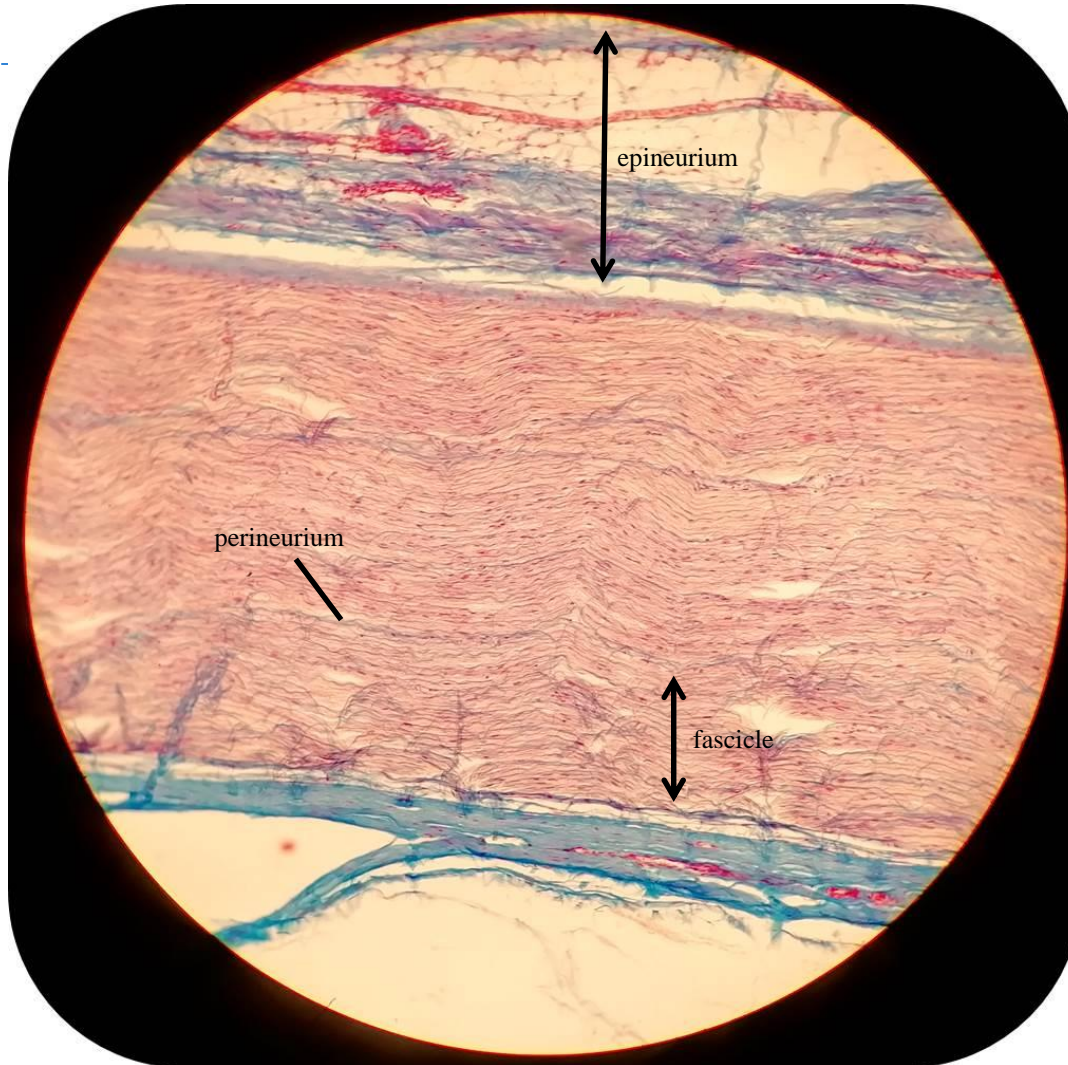
- ▶ The nerve fiber and Schwann cells are surrounded by a thin layer of connective tissue, consisting mainly of a fine network of reticular fibers along with sparse fibroblasts and blood capillary. This layer is known as **endoneurium**
- ▶ A group of nerve fibers, Schwann cells and endoneurium formed a fascicle which is wrapped by a layer of another connective tissue. This layer is known as **perineurium**
- ▶ All bundles of fascicle also hold together by **epineurium** which is made from dense connective tissue. Epineurium forms septa between fascicles. Large blood vessels can be observed in these septa



Nerve organization; from <https://blog.sililoconnect.com/structure-and-function-of-nervous-tissue/>



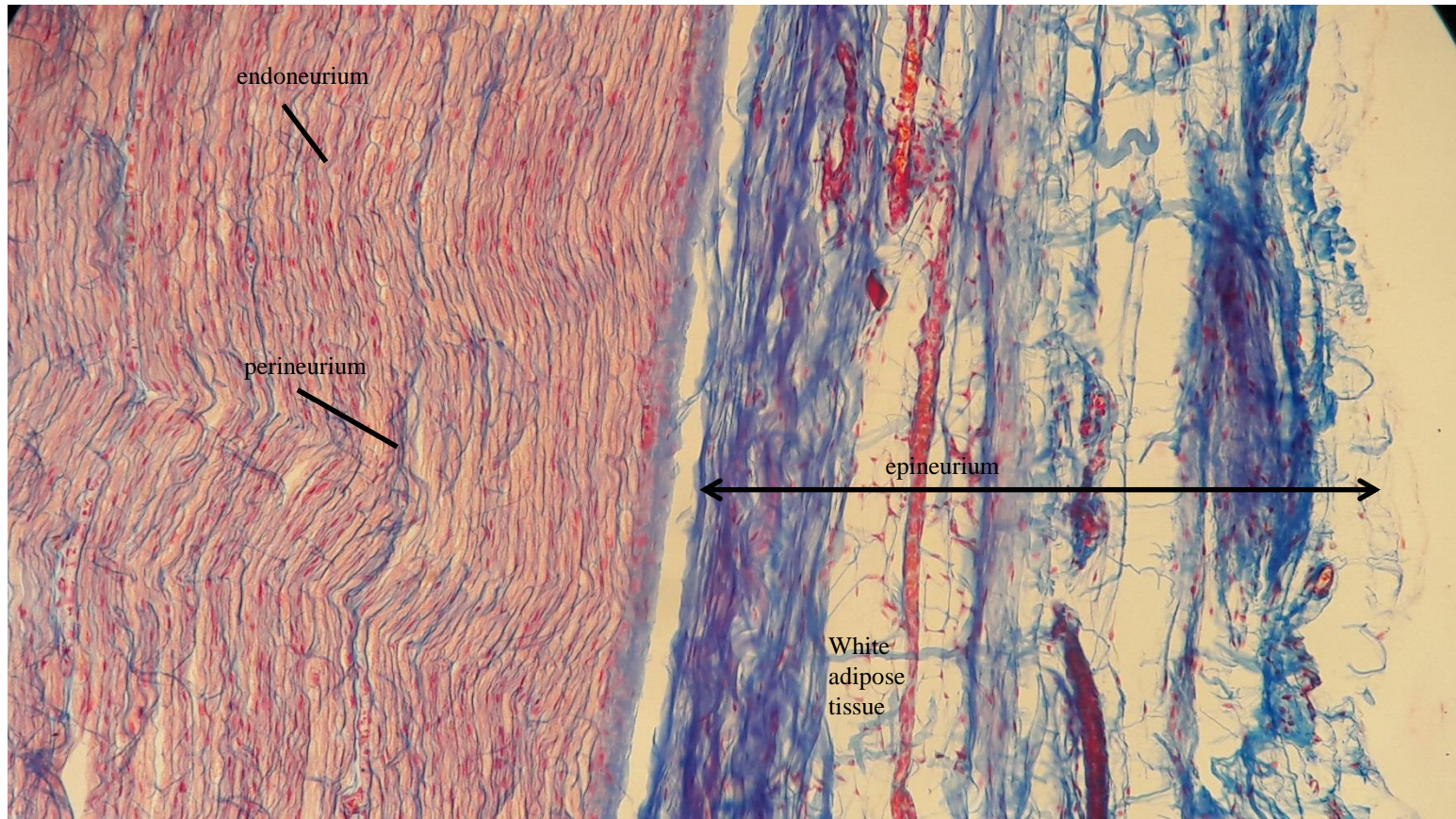
Nerve



Longitudinal section of siatic nerve, Note the white adipose tissue in epineurium; H&E, 10X. This picture is taken from histological slide in histology laboratory of Isfahan University



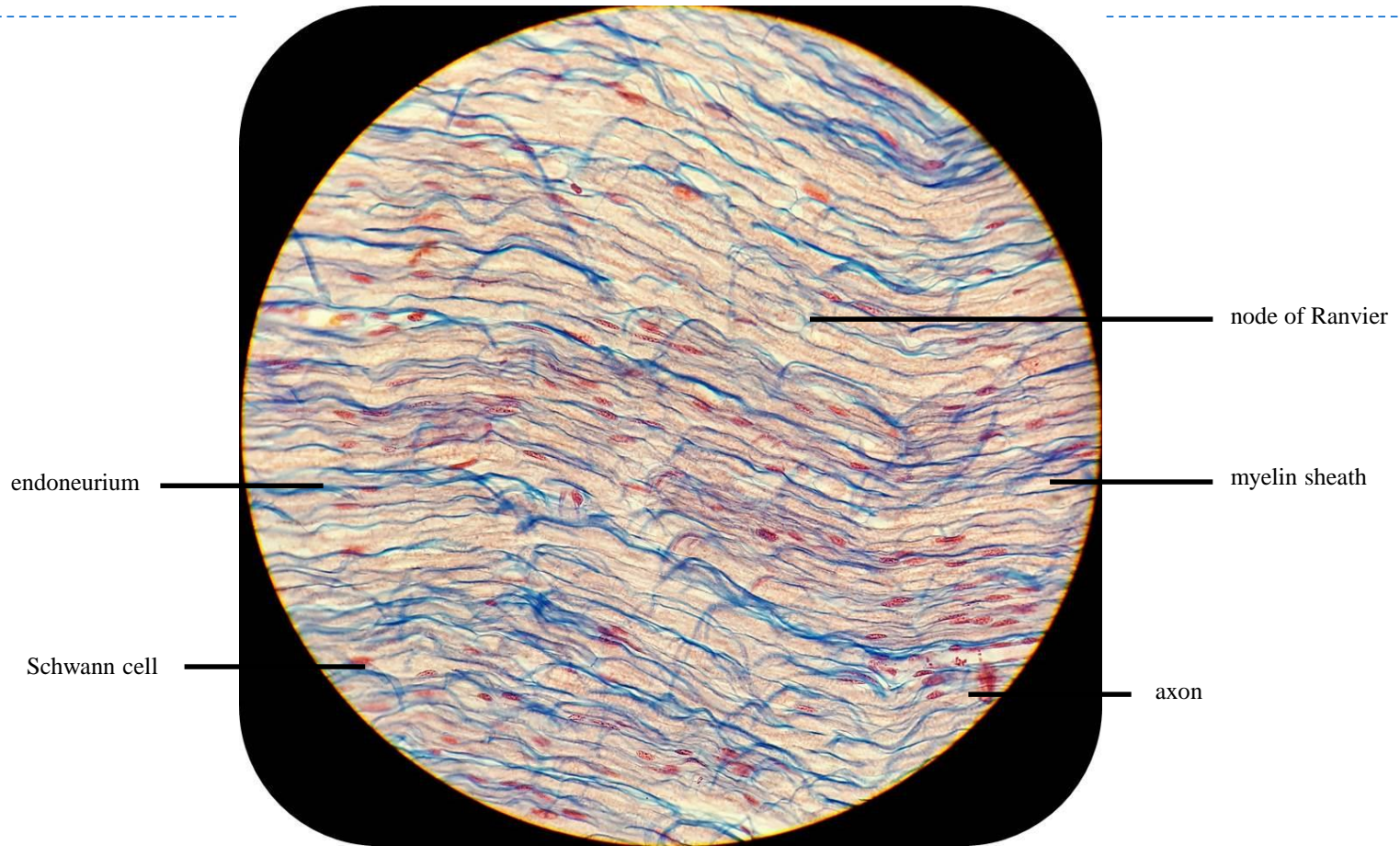
Nerve



Longitudinal section of sciatic nerve; H&E, 17X. This picture is taken from histological slide in histology laboratory of Isfahan University



Nerve

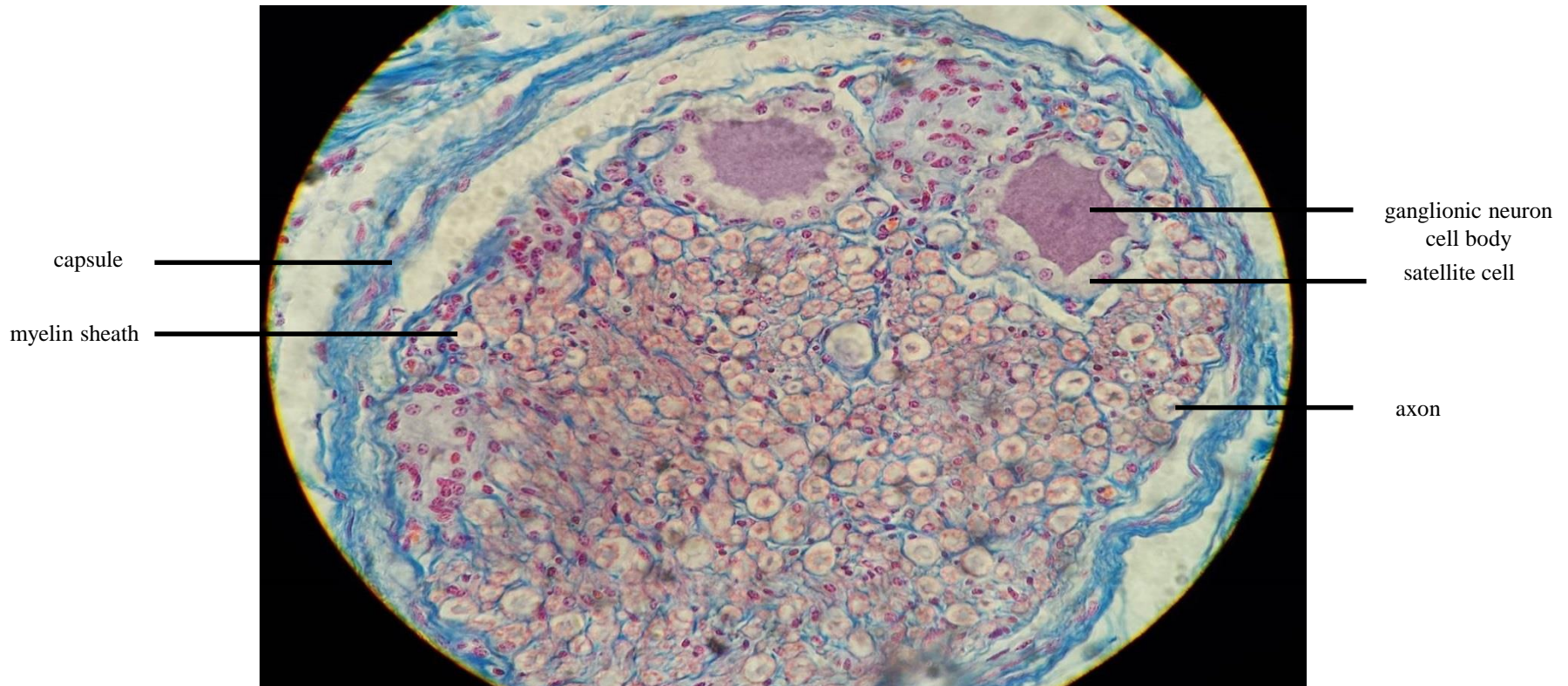


Longitudinal section of a nerve; H&E, 40X. This picture is taken from histological slide in histology laboratory of Isfahan University



Ganglion

- ▶ Ganglion is an egg shaped structure composed of neuron cell bodies and glial cells (satellite cell and Schwann cell). There are two types of ganglia: sensory and autonomic ganglia
- ▶ Ganglion is surrounded by a sheath of dense connective tissue called capsule

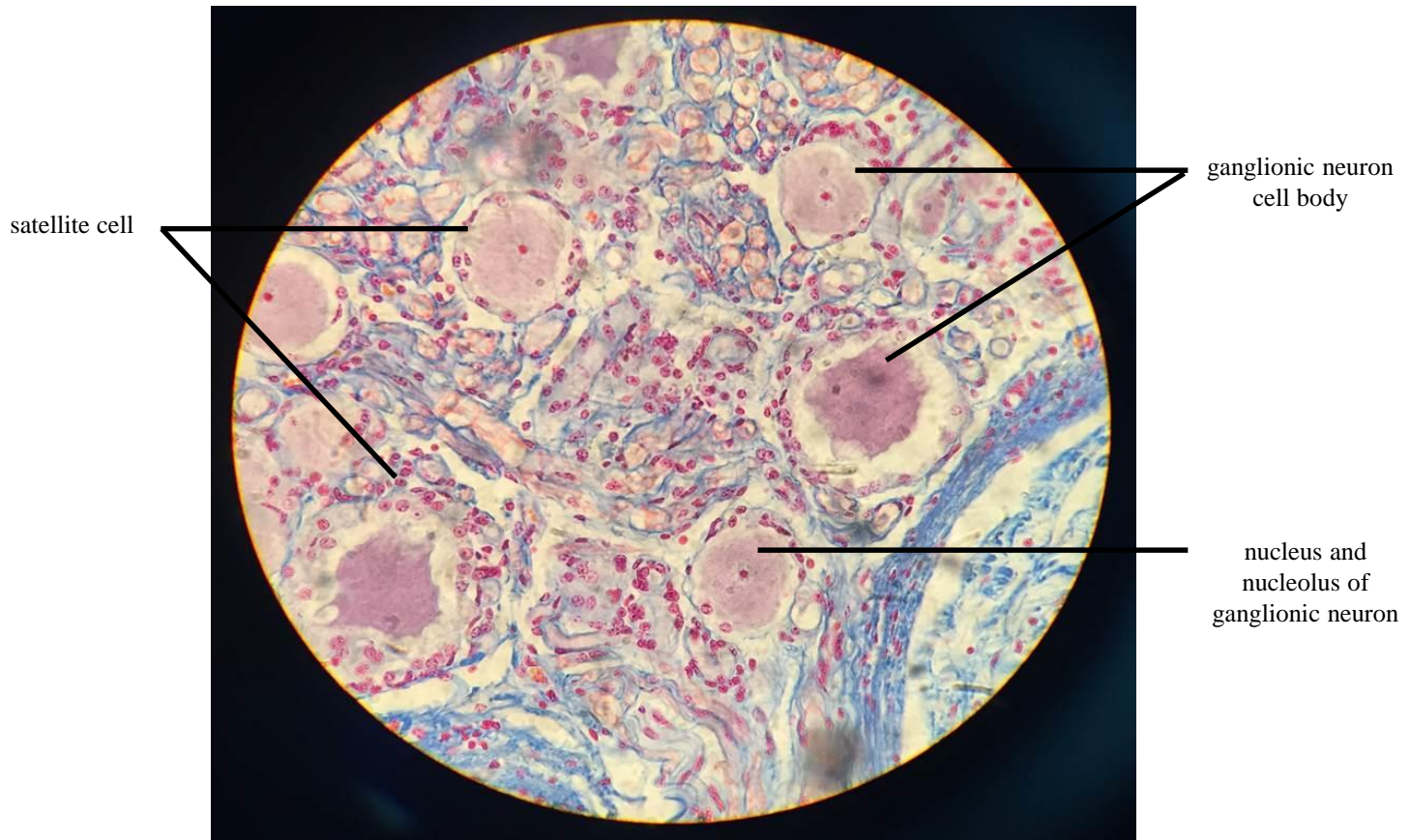


Cross section of dorsal root ganglion; H&E, 4X. This picture is taken from histological slide in histology laboratory of Isfahan University



Sensory ganglion

- ▶ A dorsal root ganglion (DRG) or spinal ganglion is a sensory ganglion which contain a cluster of sensory neuron cell bodies. They are found on the posterior roots of each spinal nerve
- ▶ DRG neurons are pseudounipolar cells with round cell bodies

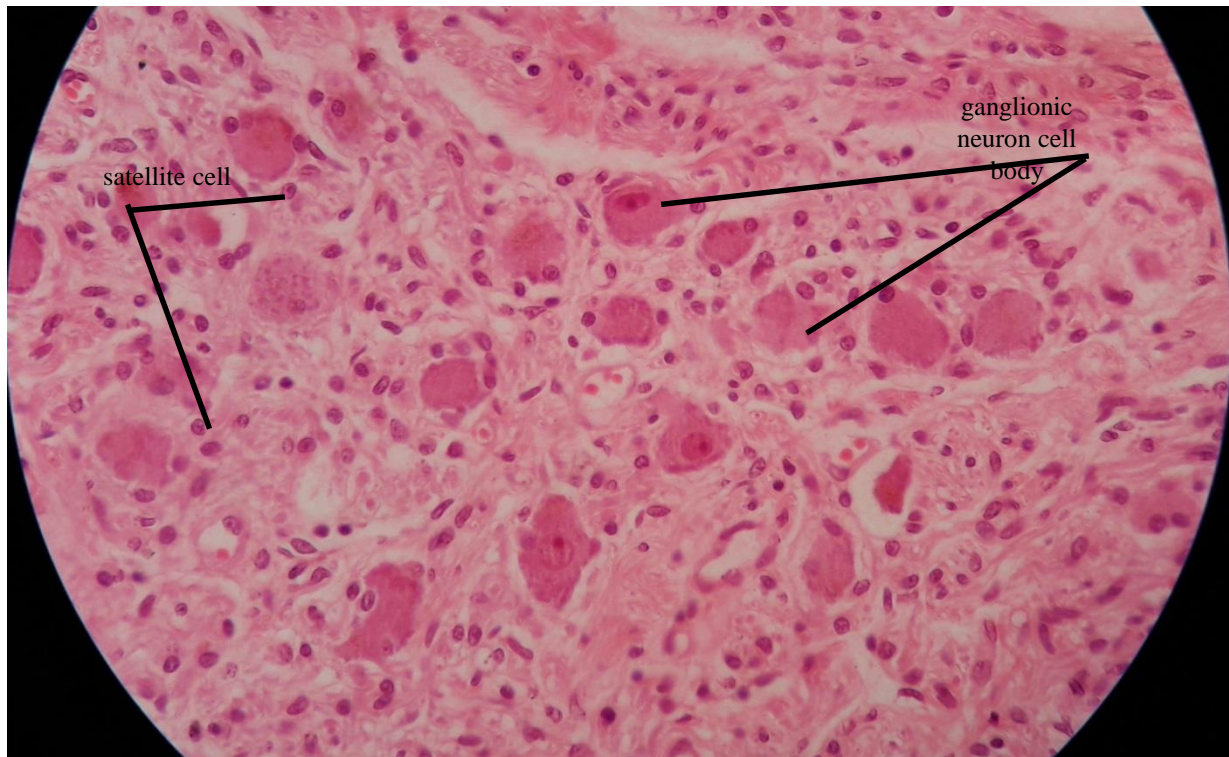


Cross section of dorsal root ganglion; H&E, 10X. This picture is taken from histological slide in histology laboratory of Isfahan University



Autonomic ganglion

- ▶ Autonomic ganglia can be divided into two types: sympathetic and parasympathetic. The cell bodies of postganglionic neurons are located in these ganglia
- ▶ Sympathetic ganglia contain multipolar neurons. These neurons have polygonal cell bodies

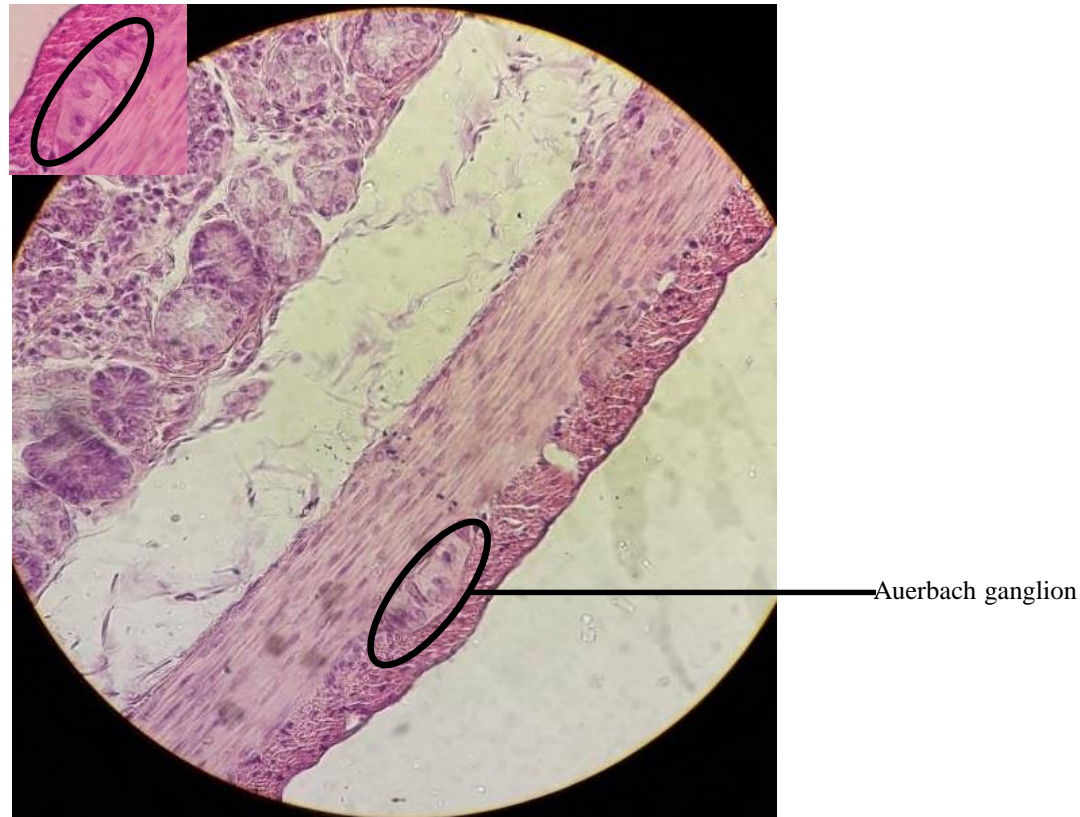


Cross section of sympathetic ganglion; H&E, 10X. This picture is taken from histological slide in histology laboratory of Isfahan University



Autonomic ganglion

- ▶ Parasympathetic ganglia are found in head, neck and in the trunk close to or within the walls of visceral organs



Cross section of duodenum. Auerbach ganglia is a parasympathetic ganglion which is located between circular and longitudinal muscular layer; H&E, 10X. top box: 100X. This picture is taken from histological slide in histology laboratory of Isfahan University